PUMP

PFD4/PFS4

OPERATING INSTRUCTIONS

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Thank you for choosing our SAINT-GOBAIN PERFORMANCE PLASTICS ASTI AstiPure™ model PFD4 pump, series 3 (or PFS4: slurry applications).

I – General

I.1 – Introduction

The model PFD/PFS is a pneumatically operated ***TEFLON***® pump. There are no internal or external metal parts.
The pump is designed for handling corrosive, inflammable, and sterile fluids. It meets the requirements of the semiconductor, pharmaceutical and chemical industries.

I.2 – Materials

All wetted parts are manufactured in ***TEFLON***® PFA HP and PTFE.
Other parts are made of high-tech plastics such as PVDF, PEEK etc.
There are no metal parts.

I.3 – Operation

The pump is pneumatically operated; two bellows joined by a central shaft reciprocate horizontally. The suction and delivery strokes alternate from one side of the pump to the other.
The pump is self-priming and has four balls, which seat on lip seals (check valves).
The pumping frequency of a bellows pump is much slower than an equivalent diaphragm pump and results in an extended life for the bellows.
Pulsation dampers with wetted parts in ***TEFLON***® PFA and PTFE are available as an option. This dampens the pulse by approximately 65 to 80%.
The pulsation damper for the PFD4/PFS4 pump is AMC4/AMS4.

I.4 – Pump data

Flow rate	25 GPM (6000 L/h)
Discharge pressure	58 PSI (4 bar)
Suction head	13 feet water column (4 m)
Max. air consumption	23.5 SCFM (40 m³/h) TPN.
Fluid connection	***TEFLON***® tubing ∅ 7/8”x1” (22x25 mm) or flange PN 10 DN 25.
Air connection.	1/2" gas Tubing ∅ 3/8”x1/2” (10x13 mm) maximum 10 feet (3 m) < length < 16 feet (5 m)
Leak detector connection	M8
Weight	32 lbs (15 kg)

Our range also includes three other models with their optional pulsation dampers:

PFD1/PFS1	Flow rate 2.5 GPM (10 L/min)	AMC1/AMS1
PFD2/PFS2	Flow rate 5 GPM (20 L/min))	AMC2/AMS2
PFD3/PFS3	Flow rate 12.5 GPM (50 L/min)	AMC3/AMS3

II – Quick checklist

II.1 – Shipment

Pumps are cleaned and assembled in our clean room, then double sealed in plastic bags to ensure they are not contaminated in transit. They are then packed in cartons with Polyethylene protection.

II.2 – Reception

Upon receipt of the pump, please check that:
- The carton has not been damaged in transit. If there is any visible damage, immediately contact the carrier.
- The pump is not damaged. If there are signs of damage, you should report this immediately to SGPPL ASTI or your local distributor.
- An operating instruction manual has been included in each package. Please request another copy if it has not been included.

III – Installation and operation

III.1 – Testing

All pumps are tested with DI water at the factory in our clean room for:
- Maximum flow rate with no back pressure
- Minimum flow rate with no back pressure
- Flow rate with 58 PSI (4 bar) discharge pressure
- Checked for leakage

III.2 – Set up

The pump must be installed **horizontally** as shown on general arrangement drawing (see appendix “APP 4 EXT”). This drawing also shows the overall dimensions of the pump etc.
The pump must be **installed on its feet**. If not, the check valves will not seat correctly and the pump may malfunction.

III.3 – Connections

III.3.1 – Air/Nitrogen connections

The pump must be connected to a clean dry air or nitrogen supply. On no account should the air/nitrogen supply be lubricated, oil or water droplets will cause the shuttle valve to malfunction.
Minimum and maximum supply pressure must be between 29 and 72.5 PSI (2 and 5 bar).
For optimum pump operation, we recommend a supply pressure of 58 PSI (4 bar).
The ID of the tube supplying the dry air/nitrogen should not exceed 3/8” (10 mm). The tube length between the pump and on/off valve should be between minimum 10 feet (3 m) and maximum 19 feet (6 m).
When in aggressive conditions (acid vapors), it is advised to canalize outlet with a tube minimum ID 5/8” (15 mm).

The pneumatic on/off valve must be 3-way to ensure the shuttle valve on the pump resets itself when the pump is switched off. The flow control valve must be positioned before the 3-way on/off valve (see appendix “APP 4 CAB”).

A remote control box with on/off switch and a needle valve (P/N 24 000 04) is available as an optional extra.

III.3.2 – Fluid connections

The pump is self-priming. The inlet is at the bottom and the outlet at the top.

Two optional fittings are available:
- **PFD4 322** or **PFS4 322**: pump is supplied with flared fittings suitable for 7/8”x1” (22x25 mm) ***TEFLON***® tube. The tube needs to be flared prior to fitting using SGPPL ASTI Forming Tool (P/N MF12228).

- **PFD4 325** or **PFS4 325**: incorporates a flanged fitting PN10 DN25.

Both the inlet and outlet fittings can be turned over if necessary, by loosening the nuts on the inlet and outlet manifolds (P/N 2430M or 2435M, Mark G). For the suction manifold, first remove the base plate of the pump (P/N 2492). Re-tighten the nuts by hands.

If your pump is marked **"W"**, and you wish to change the side of the inlet and/or outlet manifolds, you must **absolutely** change the PFA seals (washers, P/N 2592, Mark F) located deep in the groove at the same time. Proceed as follows:
1) Remove the washers (with an air spray gun),
2) Fit the new washers in their grooves (a set of exchange seals is supplied with the pump: P/N WWES KIT S4),
3) Install and tighten the manifolds with a strap wrench (while tightening, you may here a bang).

III.4 –Tests and controls

Before commissioning the pump, we recommend to test it dry with a supply pressure of 72.5 PSI (5 bar) to ensure the system works correctly (See III.3.1 for the correct connections).
If the pump is cycling too quickly, reduce the speed by adjusting the needle valve.

Before using the pump with chemicals, please check:
- The manifold rings are tight (tighten by hand),
- The body tie rod nuts are tight. **Because of the material of these tie rods, tightening of couple must be controlled: we recommend 7 N.m. (Maximum is 10 N.m),**
- The air/nitrogen supply is dry, clean and between 29 and 72.5 PSI (2 and 5 bar),
- The inlet and outlet fluid connections are correctly fitted and tight.

IV – Applications

IV.1 – Chemical compatibility

All PFD/PFS pump wetted parts are manufactured in ***TEFLON***® PTFE and PFA and are suitable for pumping even the most corrosive concentrated chemicals: H_2SO_4, HNO_3, HF, H_3PO_4, HCl, NH_4OH, KOH, NaOH, CH_3COOH, TMAH, H_2O_2...
The viscosity of the fluid must be less than 1000 cpo.
PFD/PFS pumps can pump liquids containing particles up to 0.02" (0.5 mm). Very abrasive liquids are not recommended.
Please call either the factory or your local distributor if you require information on chemical compatibility.

IV.2 – Contamination

The "all plastic" construction of the PFD/PFS pump ensures no ionic contamination of the chemical, even if there is a bellows failure.

Due to the low frequency and amplitude of the bellows pump, SGPPL ASTI guarantees a lower level of particle contamination when compared to a diaphragm pump.

IV.3 – Temperature range

The PFD/PFS pump can handle liquids from 32°F (0°C) to +212°F (100°C). When the fluid temperature is greater than 140°F (60°C), you must frequently check that the manifold rings are fully tight and that supply pressure is less than 43.5 PSI (3 bar).
For special applications, call SGPPL ASTI or your local distributor.

IV.4 – Applications

The PFD4/PFS4 pump is a volumetric pump.
Each impulse delivers a constant unit stroke (about 900 cc/unit stroke).
A leak detector (in case of bellows failure) can be fitted on each pump body (female thread M8 on each half body (P/N 2472 and 2473).

- Part number marked **K** (PFD4 322K or PFS4 322K) indicates that the pump will be supplied with ***KALREZ***® manifold O.rings (P/N 2632K, Mark F) and body O.rings (P/N 2491K, Mark C).

- Part number marked **W** (PFD4 322W or PFS4 322W) indicates that the pump will be supplied with PFA manifold seals (P/N 2592, Mark F), PTFE body rings (P/N 2593, Mark C), and special manifolds (P/N 2591M or 2599M, Mark G).

- Part number marked **G** (PFD4 322G or PFS4 322G) indicates that the pump will be supplied with special manifolds with no seals (P/N 2430G or 2435G, Mark G) and PTFE body rings (P/N 2593, Mark C).

PFS4 pumps are equipped with valve seats without lip (P/N 2629A and 2630A, Marks D and E) and rounded spires bellows (P/N 2309S, Mark B) in order to pump abrasive products (slurry).

Common applications are:
- Semiconductor Industry: Transfer of ultrapure and corrosive chemicals. Pump filter recirculation systems.
- Pharmaceuticals and Chemicals: Chemical injection and sampling.

IV.5 – Limitations of use

The standard speed of PFD4/PFS4 pump is about 100 strokes/minute.

The following should NOT be part of the system:
- **Do not connect the pump inlet or outlet with air, nitrogen or liquid under pressure.**
- **Lubricated and/or wet air or nitrogen,**
- **Air supply tubing greater than 3/8" (10 mm),**
- **Air line length between the pump and control valve less than 10 feet (3 m) and more than 19 feet (6 m),**
- **Air pressure less than 29 PSI (2 bar) or more than 72.5 PSI (5 bar),**
- **Inlet connection less than 7/8" (22 mm),**
- **Restricting inlet (valve, filter...),**
- **Exceed the recommended liquid temperatures,**
- **Pumping too viscous or abrasive liquids.**

Any of the above can be detrimental to the normal operation and life expectancy of the pump, and may invalidate the warranty.

If the pump is used with very corrosive chemicals and left for extended periods not in use, we recommend the system is emptied and flushed.

V – Maintenance

V.1 – Trouble shooting

If the pump stops for any reason, check:
- The air/nitrogen supply,
- That all valves in the chemical line are open,
- That pneumatic screws (P/N 2478) are correctly tightened.

Before dismantling the pump, check the following:
- The air/nitrogen supply is OFF,
- The chemical and discharge lines are empty, and there is no pressure,
- All in line valves are closed,
- **You follow your local Health and Safety regulations with regard to particular chemicals.**

V.2 – Preventive maintenance

Important: for "W" pumps, PTFE body seals (P/N 2593, Mark C) and PFA manifold seals (P/N 2592, Mark F) must be changed each time you disassemble the pump. For "G" pumps, PTFE body seals (P/N 2593, Mark C) must be changed each time you disassemble the pump. Retighten manifold nuts simultaneously and progressively with a strap wrench in order to ensure a correct tightness.

V.2.1 – Continuous operation

When the pump is used continuously, it is necessary to replace the following parts every year:
- Central shaft O.rings P/N 2496
- Central shaft P/N 2477

Important: the central rod and central rod O.rings should always be replaced together.

During routine maintenance checks, examine the following parts, and change them if necessary:
- Bellows P/N 6530 (PFD) or 2309S (PFS)
- Shuttle valve system P/N 2493
- Viton bellows O.rings P/N 4813
- FEP body O.rings P/N 2491S
- Manifold O.rings P/N 2632S and 2632K
- Suction lip seals P/N 2629 (PFD) or 2629A (PFS)
- Delivery lip seals P/N 2630 (PFD) or 2630A (PFS)
- Check valves P/N 2633
- Silencers P/N 2494

V.2.2 – Intermittent operation

If the pump is used intermittently, it is advised to replace all wearing parts every 18 months (shaft composite rings and central shaft) and to check other parts (bellows, shuttle valve system, other O.rings, lip seals...).
If the pump is left standing full of chemical for long periods all the Viton O.rings should be replaced.

V.3 – Comments

If the pump is used to pump hot chemicals in excess of 140°F (60°C) the preventive maintenance schedule time scale should be divided by 2:
- Every 6 months check as for continuous operation,
- Every 9 months check as for intermittent operation.

The above is based on SGPPL ASTI's experience.
SGPPL ASTI cannot be held responsible for premature failures if the pump is misused, or damaged due to an incorrect application.

VI – Dismantling and repair

Attention: Part numbers quoted in this manual are those used on a "standard" PFD/PFS pump. Before ordering, please check the spare parts list, the section view of the pump and the part numbers table (see encl. documents).

VI.1 – How to dismantle

Before dismantling the pump, please refer to the Maintenance schedule V.1, and proceed as follows:
- Disconnect the air/nitrogen supply,
- Remove the inlet and outlet connections (beware of any chemical droplets remaining on the inside),
- Rinse the outside of the pump in DI water to remove all trace of chemicals,
- Remove pump support screws.

VI.2 – Examination

To comply with your local Health and Safety Regulations, it is essential the pump and all parts be thoroughly cleaned both on the inside and the outside.
See V.2 for the Preventive Maintenance Schedule.
To repair the pump, please refer to V.1 and V.2.1.

VI.3 – Stripping and assembling the pump

The SGPPL ASTI design ensures that the pumps are easy to strip and assemble.
The only tool required to repair the pump is a torque wrench (2-20 N.m) to check that the tie rods nuts (P/N 2490) are fastened. A tools kit for the whole maintenance is available (P/N KPFD4), as well as maintenance kits (P/N AIR PFD4, LIQ PFD4, and MEC PFD4), and a preventive maintenance box (P/N PM PFD4, PM PFS4, PM PFD4G or PM PFS4G). For more details on these kits, please report to appendix documents.

VI.3.1 – Replacing the shuttle valve system

The valve is easily removed from the outside:
1) Unscrew the two PVDF screws (P/N 2478). They are hand tightened, so you do not need any tool,
2) Remove the 2 screws (only a few cm),
3) Remove the shuttle valve,
4) Replace with the new one (P/N 2493, Mark A),
5) Carefully tighten the 2 screws,
6) Test with compressed air/nitrogen. Retighten if necessary.

VI.3.2 – Replacing the bellows

1) Unscrew the 4 nuts (P/N 2607) from the pump support (P/N 2492),
2) Unscrew the 4 manifold nuts. **Be careful not to loose the inlet valves** (P/N 2633),
3) Put aside the 4 manifold nuts (2632S and 2632K, Mark F), except for PFD/S4…**W** pumps: seals (P/N 2592, Mark F) must **absolutely** be changed (with an air spray gun), and PFD/S4…**G** pumps that have manifolds with no seals,
4) Unscrew the 16 nuts (P/N 2490) holding the pump bodies,
5) Remove the PFA pump body (P/N 2471 or 2471G, Mark I),
6) Unscrew the bellows (P/N 6530 or 2309S, Mark B) from the central shaft (P/N 2477),
7) Replace with new bellows and hand tighten,
8) To re-assemble, use reverse order of above-mentioned steps (from 4 to 1). For PFD/S4…**W** and **G** pumps, you must **absolutely** change body rings (P/N 2593, Mark C) before re-assembling. Retighten manifold nuts progressively with a strap wrench.

All ***TEFLON***® PTFE and PFA parts are very soft. Please handle with care to avoid damage. **Do not put them on their sealing surfaces.**

Caution: To tighten the 16 nuts, you need a torque wrench (tightening couple: 7 N.m - **Cross tightening)**.

VI.3.3 – Replacing the central shaft and shaft O.rings

Disassemble the shuttle valve system (See VI.3.1, step 3) and follow the steps described in VI.3.2 until 6). Unscrew the bellows and:

7) Remove the central shaft (P/N 2477),
8) Remove the 2 shaft O.rings (P/N 2496),
9) Clean up the supports (P/N 2472 and 2473) and core (P/N 2474), ensure any dust due to previous O.rings wear is removed and all parts are clean.
10) Correctly replace the new rings,
11) **Important**: when re-assembling central shaft, lightly wipe it with **silicon grease (Molykote 111)**,
12) To re-assemble, follow the above but in reverse order.

VI.3.4 – Replacing the bellows and body O.rings

After removing the bellows (See VI.3.2, step 6), remove the bellows (P/N 4813) and body O.rings (P/N 2491S or 2593, Mark C). Carefully replace the new ones **without scratching the surface of the bellows (P/N 6530 or 2309S, Mark B) and bodies (P/N 2741 or 2471G, Mark I).**

VI.3.5 – Replacing manifold O.rings

Follow point VI.3.2, steps 1) and 2). Carefully replace the manifold O.rings (P/N 2632S and 2632K, Mark F). Take care, as these parts are fragile, **especially the elbow connectors**.
If your pump is marked with **"W"**, change the manifold seals (P/N 2592, Mark F) and retighten progressively with a strap wrench.

NB: This chapter does not concern PFD/S4…**G** pumps that have no manifold seals.

VI.3.6 – Replacing other parts

When dismantling the pump or control unit for service, components found damaged should be replaced. Alternatively, the pump/control unit can be returned to your distributor or SGPPL ASTI for examination, estimate, and repair.

Important: Please indicate what chemical was handled, the frequency of use, and the reason for returning the pump.

A receipt note "Conditions of use" is at your disposal. Do not hesitate to ask for it when needed.

An estimate for repair will be proposed to you and the pump will be returned to you within one week from date of its acceptance.

VII – Warranty

SGPPL ASTI pumps and accessories are warranted for all parts and labor against faulty workmanship (return to factory) for one year from delivery date (9000 hours of use).

SGPPL ASTI is not responsible for damage to its products through improper installation, maintenance, use or attempts to operate them beyond their mechanical capacity, intentionally or otherwise, or for unauthorized repair.

SGPPL ASTI shall not be liable for any indirect, special, incidental or consequential damages resulting from the use, failure or malfunction of any product.

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PFD4 PUMP (SERIES 3) & PFS4

PART NUMBER	DESIGNATION	QUANTITY			
		PFD4 . . .		PFS4 . . .	
		322	325	322	325
1054	O.RING	2	2	2	2
2309S	PFS4 ROUNDED SPIRES BELLOW + INSERT			2	2
2404	INTERNAL O.RING	2	2	2	2
2430G	PFD4 MANIFOLD TUBE 1" TG	2		2	
2430GZ	PFD4 MANIFOLD TUBE 1" TG ETFE NUT	2		2	
2430M	PFD4 MANIFOLD TUBE 1"	2		2	
2430Z	PFD4 MANIFOLD TUBE 1" ETFE NUT	2		2	
2435G	PFD4 MANIFOLD FLANGE PN10 DN25 TG		2		2
2435GZ	PFD4 MANIFOLD FLANGE PN10 DN25TG ETFE NUT		2		2
2435M	PFD4 MANIFOLD FLANGE PN10 DN25		2		2
2435Z	PFD4 MANIFOLD FLANGE PN10 DN25 ETFE NUT		2		2
2471	PFD4 PFA BODY	2	2	2	2
2471G	PFD4 TG PFA BODY	2	2	2	2
2472	1/2 BODY A	1	1	1	1
2473	1/2 BODY B	1	1	1	1
2474	CORE	1	1	1	1
2477	CENTRAL SHAFT	1	1	1	1
2478	PNEUMATIC SCREW	2	2	2	2
2489	TIE ROD	8	8	8	8
2490	M10 NUT	16	16	16	16
2491K	KALREZ BODY O.RING	2	2	2	2
2491S	FEP BODY O.RING	2	2	2	2
2492	BASE PLATE	1	1	1	1
2493	SHUTTLE VALVE SYSTEM	1	1	1	1
2494	SILENCER 1/2"	1	1	1	1
2496	CENTRAL SHAFT O.RING	2	2	2	2
2591M	PFD4 WWES MANIFOLD 1"	2		2	
2591Z	PFD4 WWES MANIFOLD 1" ETFE NUT	2		2	
2592	PFD4 WWES MANIFOLD SEAL	4	4	4	4
2593	PFD4 WWES BODY RING	2	2	2	2
2599M	PFD4 WWES T. FLANGE DN25		2		2
2599Z	PFD4 WWES T. FLANGE DN25 ETFE NUT		2		2
2607	PVDF T/C 8x30 SCREW	4	4	4	4
2629	PFD4 INLET LIP SEAL	2	2		
2629A	PFS4 INLET VALVE SEAT			2	2
2630	PFD4 OUTLET LIP SEAL	2	2		
2630A	PFS4 OUTLET VALVE SEAT			2	2
2632K	KALREZ MANIFOLD O.RING	2	2	2	2
2632S	FEP MANIFOLD O.RING	2	2	2	2
2633	VALVE	4	4	4	4
2716	SHUTTLE VALVE O.RING	2	2	2	2

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PFD4 PUMP (SERIES 3) & PFS4

PART NUMBER	DESIGNATION	QUANTITY			
		PFD4 . . .		PFS4 . . .	
		322	325	322	325
3134	PNEUMATIC O.RING	2	2	2	2
4813	VITON BELLOW O.RING	2	2	2	2
6530	PFD4 BELLOW + INSERT	2	2		
MS11"	PVDF NUT TUBING 1" OD	2		2	
MS21"	PFA NUT TUBING 1" OD	2		2	
RGL2222	SPACE SAVER CONNECTOR 1"	1		1	
WWES KIT S4	SET OF 4 MANIFOLD SEALS 2592 PFD4	1	1	1	1

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PUMP PFD4 (SERIES 3) – MAINTENANCE KITS

PART NUMBER	DESIGNATION	QUANTITY			
		AIR PFD4	LIQ PFD4	MEC PFD4	PM PFD4
1054	O.RING			2	2
2404	INTERNAL O.RING				2
2477	CENTRAL SHAFT			1	1
2489	TIE ROD				2
2490	NUT M10				4
2491S	FEP BODY O.RING		2		2
2493	SHUTTLE VALVE SYSTEM	1			1
2494	SILENCER 1/2"	1		1	1
2496	CENTRAL SHAFT O.RING			2	2
2629	PFD4 INLET LIP SEAL		2		2
2630	PFD4 OUTLET LIP SEAL		2		2
2632K	KALREZ MANIFOLD O.RING		2		2
2632S	FEP MANIFOLD O.RING		2		2
2633	VALVE		4		4
2716	SHUTTLE VALVE O.RING				2
3134	PNEUMATIC O.RING				2
4813	VITON BELLOW O.RING VITON		2		2
6530	PFD4 BELLOW + INSERT		2		2

PUMP PFS4 – MAINTENANCE KIT P/N "PM PFS4"

PART NUMBER	DESIGNATION	QUANTITY
1054	O.RING	2
2309S	PFS4 ROUNDED SPIRES BELLOW + INSERT	2
2404	INTERNAL O.RING	2
2477	CENTRAL SHAFT	1
2489	TIE ROD	2
2490	M10 NUT	4
2491S	FEP BODY O.RING	2
2493	SHUTTLE VALVE SYSTEM	1
2494	SILENCER 1/2"	1
2496	CENTRAL SHAFT O.RING	2
2629A	PFS4 INLET VALVE SEAT	2
2630A	PFS4 OUTLET VALVE SEAT	2
2632K	KALREZ MANIFOLD O.RING	2
2632S	FEP MANIFOLD O.RING	2
2633	VALVE	4
2716	SHUTTLE VALVE O.RING	2
3134	PNEUMATIC O.RING	2
4813	VITON BELLOW O.RING	2

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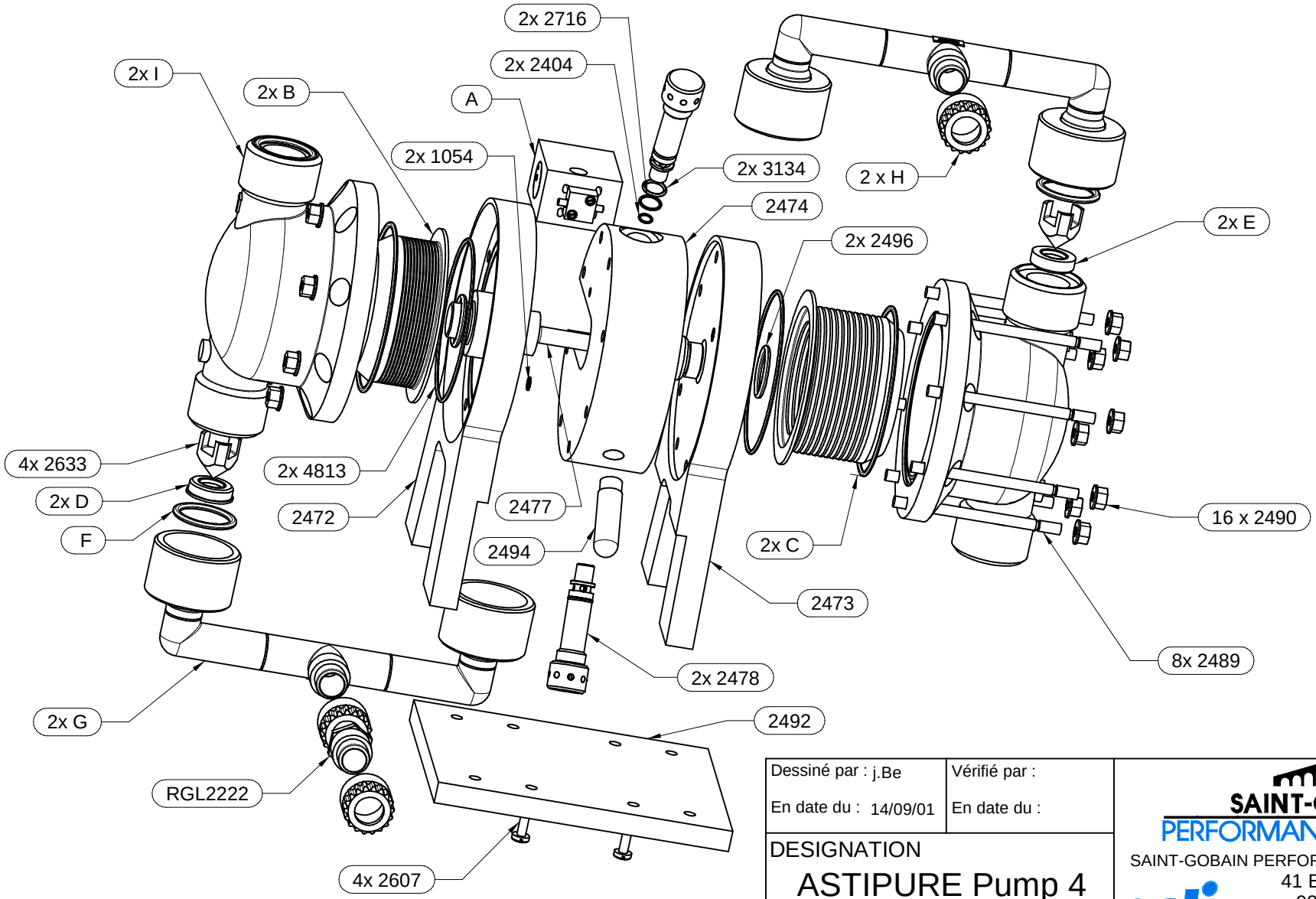
PUMP "PFD4…G" – MAINTENANCE KIT P/N "PM PFD4G"

PART NUMBER	DESIGNATION	QUANTITY
1054	O.RING	2
2404	INTERNAL O.RING	2
2477	CENTRAL SHAFT	1
2489	TIE ROD	2
2490	NUT M10	4
2493	SHUTTLE VALVE SYSTEM	1
2494	SILENCER 1/2"	1
2496	CENTRAL SHAFT O.RING	2
2593	PFD4 WWES BODY SEAL	2
2629	PFD4 INLET LIP SEAL	2
2630	PFD4 OUTLET LIP SEAL	2
2633	VALVE	4
2716	SHUTTLE VALVE O.RING	2
3134	PNEUMATIC O.RING	2
4813	VITON BELLOW O.RING	2
6530	PFD4 BELLOW + INSERT	2

PUMP "PFS4…G" – MAINTENANCE KIT P/N "PM PFS4G"

PART NUMBER	DESIGNATION	QUANTITY
1054	O.RING	2
2309S	PFS4 ROUNDED SPIRES BELLOW + INSERT	2
2404	INTERNAL O.RING	2
2477	CENTRAL SHAFT	1
2489	TIE ROD	2
2490	M10 NUT	4
2493	SHUTTLE VALVE SYSTEM	1
2494	SILENCER 1/2"	1
2496	CENTRAL SHAFT O.RING	2
2593	PFD4 WWES BODY SEAL	2
2629A	PFS4 INLET VALVE SEAT	2
2630A	PFS4 OUTLET VALVE SEAT	2
2633	VALVE	4
2716	SHUTTLE VALVE O.RING	2
3134	PNEUMATIC O.RING	2
4813	VITON BELLOW O.RING	2



Dessiné par : j.Be En date du : 14/09/01	Vérifié par : En date du :
DESIGNATION ASTIPURE Pump 4	
REFERENCE APP4REF	INDICE 01

SAINT-GOBAIN
PERFORMANCE PLASTICS
SAINT-GOBAIN PERFORMANCE PLASTICS ASTI
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92000 Nanterre - France
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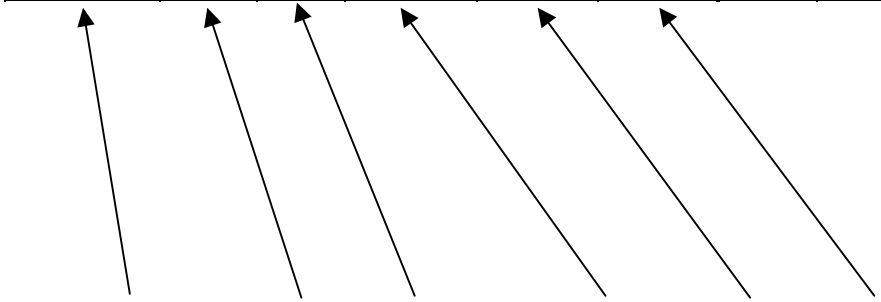
http://www.astipure.com

PART NUMBERS TABLE

Piloting	Fluid	Size	Connection	Sealing	Option	A	B	C	D	E	F	G	H	I
PF (standard)	D	4				2493	6530	2491S	2629	2630	2 x 2632S 2 x 2632K			2471
	S	4					2309S		2629A	2630A	2 x 2632S 2 x 2632K			
			322									2430M	MS11"	
			325									2435M		
				W			6530	2593			4 x 2592	2591M or 2599M		
				K			6530	2491K			4 x 2632K			
				G			6530	2593				2430G or 2435G		2471G
					Z							P/N - "M" + "Z" or 2430GZ or 2435GZ	MS21"	



A : Shuttle valve system
B : Bellow
C : Body O.ring
D : Suction lip seal
E : Delivery lip seal
F : Manifold O.ring
G : Manifold
H : Nut
I : Pump body

Piloting:
PF Standard

Fluid :
D Standard
S Slurry

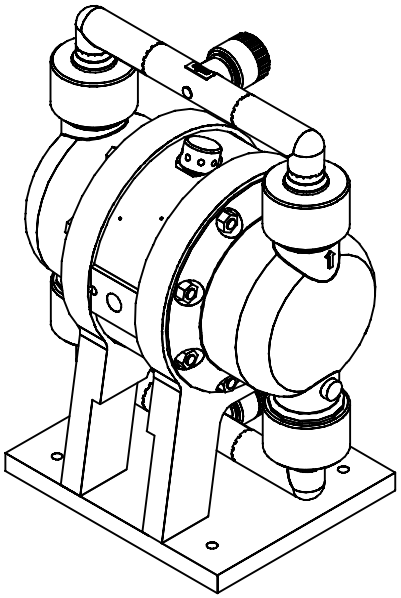
Option :
Z Tefzel nut

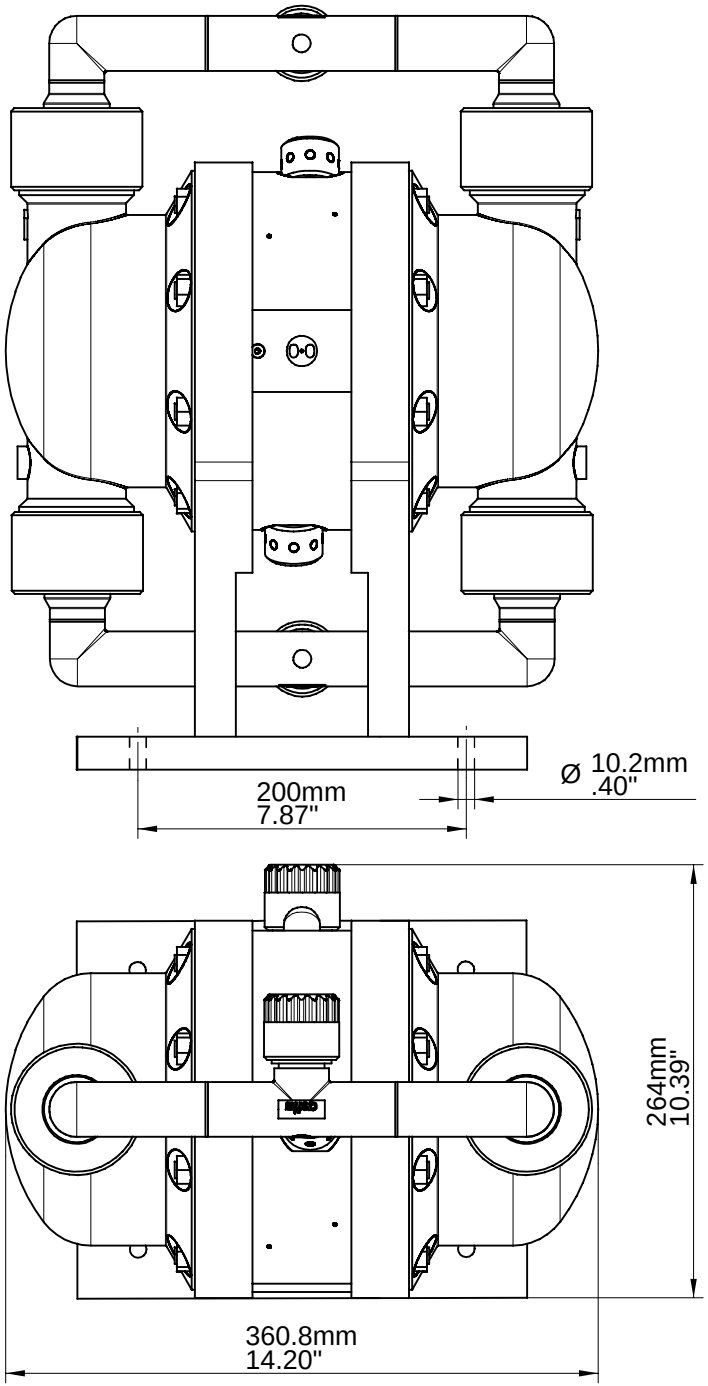
Connection:
322 Flare Fitting Ø 22x25mm or 7/8"x1"
325 Flange PN10 DN25

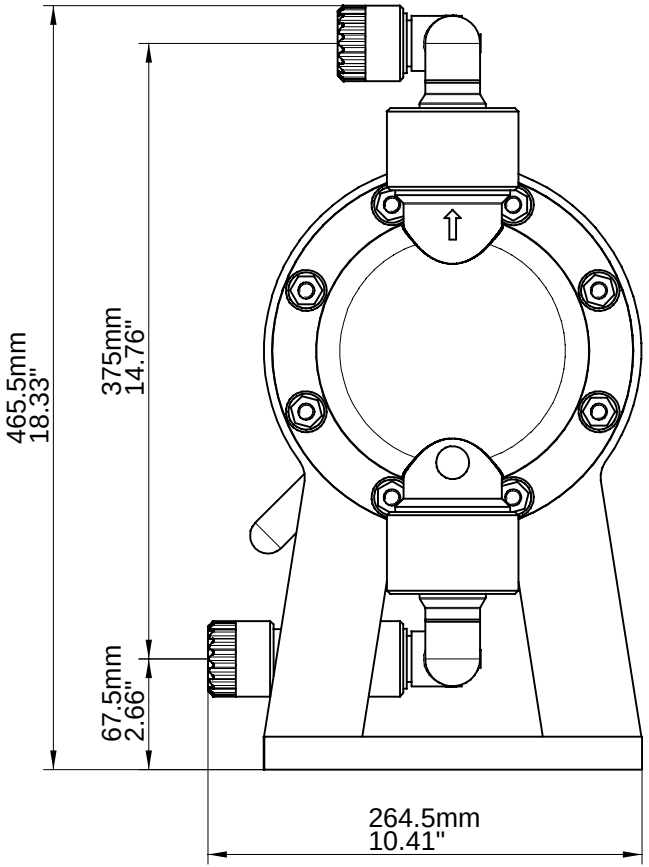
Sealing:
- FEP
W Without Wet Elastomer Seals (WWES)*
K Kalrez
G Manifolds with no seals

**Please call us before ordering*

Date: 21/03/02
Index: 03

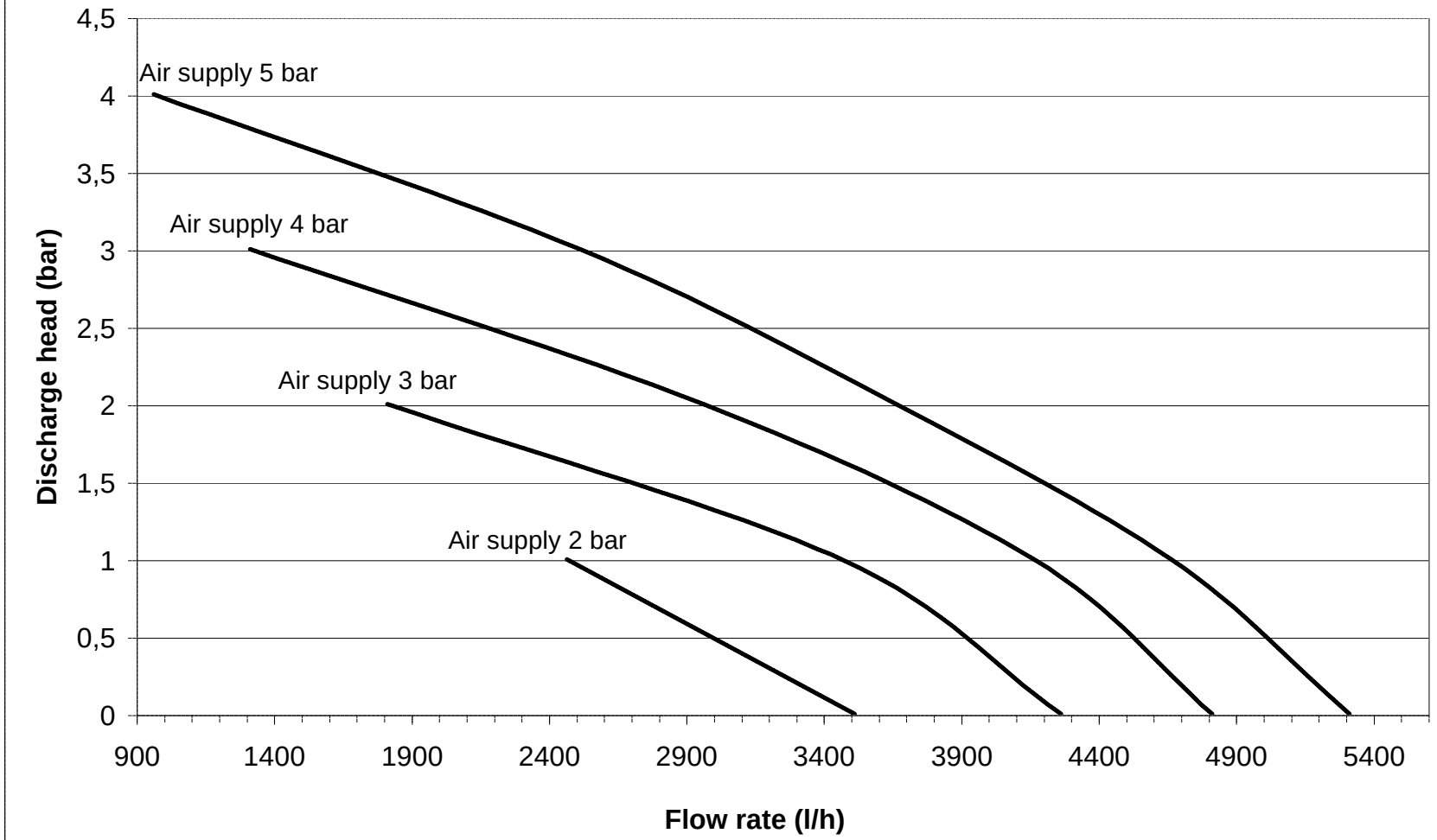




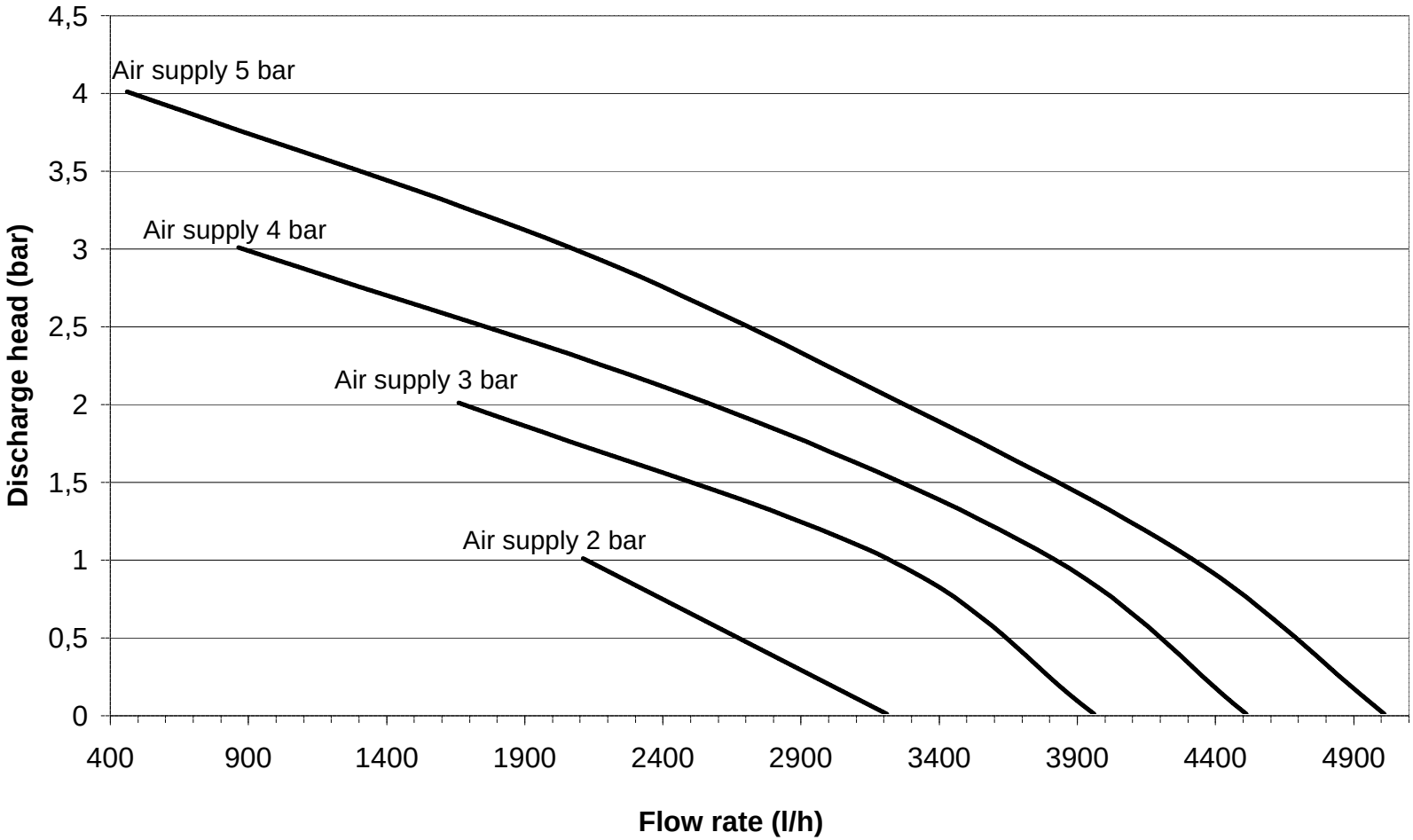


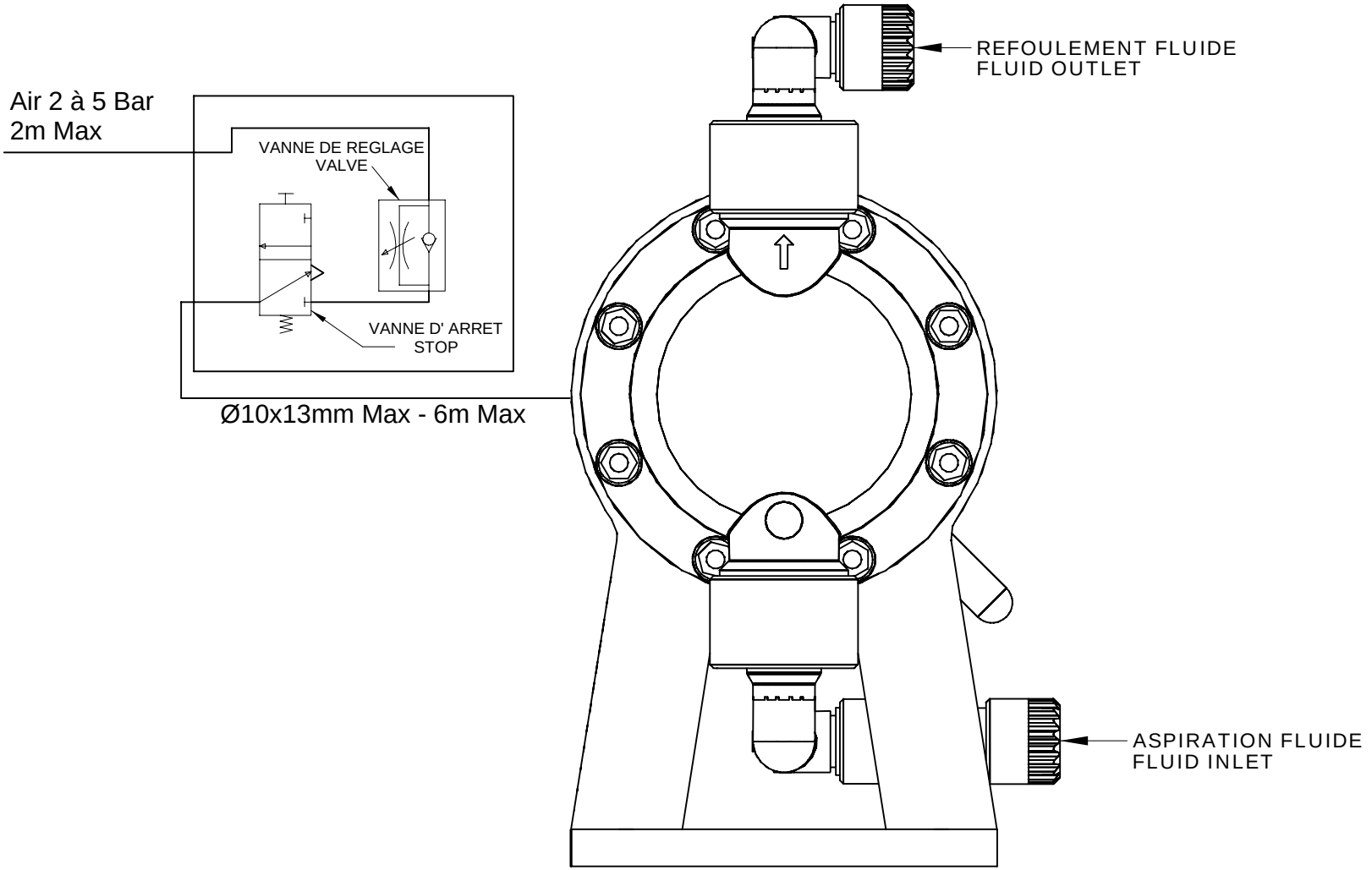
Dessiné par: FM Validé par:	DATE: 12/07/00	**SGPPL ASTI** 41 Boulevard des Bouvets F-92741 Nanterre Cedex FRANCE Tel: +33 (0)1 55 68 59 59 Fax: +33 (0)1 55 68 59 68
DESIGNATION ASTIPURE Pump 4		
REFERENCE APP 4 EXT	INDICE 00	

AstiPure™ PFD4 pump flow rate characteristics



AstiPure™ PFS4 pump flow rate characteristics





Dessiné par: FM Validé par:	DATE: 13/07/00	**SGPPL ASTI** 41 Boulevard des Bouvets F-92741 Nanterre Cedex FRANCE Tel: +33 (0)1 55 68 59 59 Fax: +33 (0)1 55 68 59 68
DESIGNATION ASTIPURE Pump 4		
REFERENCE APP 4 CAB	INDICE 00	